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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,937	11/21/2003	Richard L. Solomon	03-1506	2923
24319	7590	06/23/2006	EXAMINER	
LSI LOGIC CORPORATION			SUN, SCOTT C	
1621 BARBER LANE				
MS: D-106			ART UNIT	
MILPITAS, CA 95035			PAPER NUMBER	
			2182	

DATE MAILED: 06/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/718,937

Applicant(s)

SOLOMON ET AL.

Examiner

Scott Sun

Art Unit

2182

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 18-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 29-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Claims 18-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 3/27/2006.
2. In response to applicant's argument that examination of all claims would not impose undue burden, examiner notes that the restriction requirement showed that the inventions are related as combination and subcombinations, with separate classifications and therefore require separate search. Accordingly, these inventions are distinct and restriction for examination purposes as indicated is proper.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1-17, 34-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Regarding claim 1, the claim limitations following "determining if the queue entry includes a valid command" are only applicable "if the queue entry includes a valid command". It is uncertain what happens if the queue entry does not include a valid command. Accordingly, it is unclear what the intended metes and bounds are, as the

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claim appears to cover anything and everything that determines if the queue entry includes a valid command. Similarly, the claim limitation "if the valid command is determined to be a read command" also fails to clearly state the scope of the invention.

6. Claims 2, 4, 8-10 recite limitations similar to those of claim 1, stating an "if" condition without specifying steps to be taken if the condition fails.

7. Claims 3, 5-7, 11-17 are rejected because their dependency on one or more of the claims rejected above.

8. Claims 34-36 are rejected because of the use of the trademarks PCI, PCI-X and PCI Express. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe means for coupling and, accordingly, the identification/description is indefinite. For the purpose of continuing prosecution, the limitations will be interpreted as "a bus configured to connect to peripherals".

9. Claims 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the

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steps. See MPEP § 2172.01. Specifically, claims 5 and 6 recite two different actions (allowing a concurrent write to complete and terminating any concurrent writes) before determining if the next valid write address pointer field of the queue entry holds a valid write address pointer. However, the conditions needed to determine which of the actions to take is omitted.

10. The following rejections are made based on the examiner's best interpretation of the claims in light of the 35 USC 112 rejections above.

Claim Rejections - 35 USC § 101

11. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

12. Claims 1, 2, 4 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The method, as also described in the specification, appears to be a computer program or logic, per se (pages 8, 9, and various "if-then" logic described throughout the disclosure), which is not statutory subject matter.

13. Furthermore, claim 1 is rejected under 35 U.S.C. 101 because it lacks practical application. Specifically, merely "determining" is not a practical application, and does not produce a useful, concrete or tangible result. See *Interim Guidelines for Subject Matter Eligibility*.

14. To expedite a complete examination of the instant application, the claim(s) rejected under 35 USC 101 (nonstatutory) above are further rejected as set forth below in anticipation of applicant amending these claims to place them within the four statutory categories of invention.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 1, 2, 3-9, 29-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Langendorf et al (US Patent #6,047,334).

17. Regarding claim 1, Langendorf discloses a method for performing input/output operations on a memory by traversing a queue of commands, comprising: accessing (dequeue logic) a queue entry of a queue of commands (write queue 31, read queue 33); determining if the queue entry includes a valid command (write or read buffer empty; column 12, lines 4-12); if the queue entry includes a valid command, then determining if the valid command is a read command (detection of RD CMD request; column 12, lines 34-36); if the valid command is determined to be a read command, determining if a next valid write address pointer field (fence bit; figure 11; column 9,

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lines 12-15, lines 30-34). Examiner notes that the fence bit, if set, is matched with a corresponding entry in the write queue (also shown in figures 5-7).

18. Regarding claim 2, Langendorf discloses claim 1, and further discloses wherein the queue entry aforementioned is a first queue entry, and, further comprising, if the first queue entry includes a next valid write address pointer, then using the next valid write address pointer of the queue entry to access a second queue entry (fenced NOP1, figure 7; column 10, lines 51-56). Examiner notes that the fenced read command is not processed until the corresponding fenced NOP1 entry is reached in the write queue, and accordingly the fenced bit is used to access the second queue entry.

19. Regarding claim 4, Langendorf discloses claim 1, and further discloses if the valid command is a read command, then performing the read command (column 11, lines 5-6).

20. Regarding claims 5 and 6, examiner notes Langendorf teaches that the write commands prior to detecting the fenced NOP1 entry are allowed to continue to be dequeued (interpreted as allowing a concurrent write command to complete) and the write commands after the fenced NOP1 entry are halted from dequeuing (interpreted as terminating any concurrent write commands in progress). See column 10, lines 24-27, 35-38).

21. Regarding claim 7, Langendorf discloses claim 1, and further disclose while determining if the next valid write address pointer is valid, processing the valid command that is a read command (column 9, lines 30-34).

22. Regarding claims 8 and 9, examiner notes these claims are substantially similar to claim 2, and the same grounds of rejection are applied.

23. Regarding claims 15, 16 and 17, Langendorf discloses claim 1, and further teaches that the queue of commands is a circular queue buffer (ring queue) and can be traversed in forward or backward directions (column 6, line 56 – column 7, line 23).

24. Regarding claim 29, Langendorf discloses a system (figure 2, portions shown in detail in figure 3) for traversing a queue of commands, comprising: a means (memory controller 9) for receiving and processing commands (AGP commands), the commands being maintained in a queue of commands (read/write command queues 31 and 33); a means for storing data (memory 10), the means for storing data being coupled to the means for receiving and processing commands (figure 2, column 5, lines 36-40), the means for storing data receiving and providing data from storage in response to commands from the queue of commands (column 5, lines 20-40); wherein the queue of commands contains a Next Valid Write Address pointer (Q-head of queue advance logic 35; column 6, lines 56-60).

25. Regarding claim 30, Langendorf discloses claim 29 and further discloses means for transferring data to the means for storing data (memory access logic 27 and data lines connecting memory and memory controller) and means for transferring data from the means for storing data (memory access logic 27 and data lines connecting memory and memory controller; column 5, lines 36-40);

26. Regarding claim 31, Langendorf discloses claims 30 and further discloses wherein if an instruction for transferring data to the means for storing data (write

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command) is being processed, an instruction for transferring data from the means for storing data (read command) is simultaneously being processed (column 9, lines 65-67). Examiner notes that Langendrof teaches commands being concurrently enqueued and dequeued (interpreted as being processed) from the command queues.

Furthermore, multiple read and write commands are in the memory controller (also interpreted as being processed).

27. Regarding claim 32, Langendorf discloses claim 31 and further discloses a means for processing (command reordering logic 23) coupled to the means for storing data via the means for transferring data to the means for storing data and the means for transferring data from the means for storing data (figure 2).

28. Regarding claim 33, Langendorf discloses claim 32 and further discloses a means for coupling (line connecting command reordering logic 23 and memory access logic 27) the means for processing to the means for transferring data to the means for storing data and the means for transferring data from the means for storing data.

29. Regarding claim 34-36, Langendorf discloses claim 33, and further discloses the means for coupling is a peripheral bus (system I/O bus 3). Examiner notes that Langendorf teaches that the memory controller 9 is also used to process read and write to the peripherals (column 4, lines 45-56).

Allowable Subject Matter

30. Claims 3, 10-14 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

31. The following is a statement of reasons for the indication of allowable subject matter.

Claim 3 recites, inter alia, "using the next valid write address pointer of the queue entry to access a second queue entry" and "after accessing the second queue entry, then commencing to fill a pipeline for the write command corresponding to the second queue entry". Prior art of record do not teach or suggest, either alone or in combination, the aforementioned limitations, nor would it be obvious to modify those references to include such limitations.

Conclusion


32. Other publications are cited to further show the state of the art with respect to read/write command dependencies and links. Refer to form 892, "Notice of References Cited", for a complete list of relevant prior arts cited by the examiner.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Sun whose telephone number is (571) 272-2675. The examiner can normally be reached on M-F, 10:30am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim N. Huynh can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS



KIM HUYNH
SUPERVISORY PATENT EXAMINER
6/19/06